

CLAIMS

1. A method of cleaning a plurality of supply lines (308), all or some of the lines having an outlet control device (328) configurable to either allow or prevent fluid in the line flowing to a shared outlet conduit (326), the method including
5 steps of:

setting the outlet control devices of one or more of the plurality of supply lines to allow fluid flow to the outlet conduit;

setting the outlet control devices of the remainder of the plurality of supply lines to prevent fluid from flowing to the outlet conduit;

10 delivering cleaning fluid to the plurality of supply lines such that the fluid passes into the outlet conduit via the one or more outlet control devices so set;

monitoring the concentration of cleaning fluid passing through the outlet conduit, and

15 ceasing the delivery of cleaning fluid when the concentration reaches a predetermined level.

2. A method according to Claim 1, wherein during the cleaning fluid delivery step, cleaning fluid that does not pass into the outlet conduit (326) is steeped and agitated within the supply lines (308) to provide a cleaning action.

3. A method according to Claim 1 or 2, wherein the steps of setting the outlet
20 control devices (328), delivering the cleaning fluid and monitoring the concentration of cleaning fluid include:

a) setting the outlet control device (328A) of a first one (308A) of the plurality of supply lines to allow fluid flow to the outlet conduit (326);

b) setting the outlet control devices (328B – D) of the remaining lines (308B – D) to prevent fluid from flowing to the outlet conduit;

c) delivering cleaning fluid to the plurality of supply lines such that the fluid passes into the outlet conduit via the outlet control device (328A) of the first line
5 (308A);

d) monitoring the concentration of cleaning fluid passing through into the outlet conduit, and when the concentration reaches a predetermined level:

e) setting the outlet control device (328A) of the first line (308A) to prevent fluid from flowing to the outlet conduit, and

10 f) setting the outlet control device (328B) of a second one (308B) of the plurality of supply lines to allow fluid flow to the outlet conduit.

4. A method according to Claim 3, wherein the steps a) to e) are repeated for all or some (normally adjacent) pairs of the plurality of supply lines (308).

5. A method according to any one of the preceding Claims, further including
15 a step of draining the lines (308).

6. A method according to any one of the preceding Claims, wherein the step of delivering the cleaning fluid includes opening a valve (319) that controls flow of cleaning fluid between a cleaning fluid source (318) and the plurality of lines (308) and pumping the fluid from the source to the supply lines.

20 7. A method according to Claim 6, wherein the cleaning source valve (319) is configured to allow cleaning fluid to flow into the lines (308) periodically.

8. A method according to any one of the preceding Claims, wherein the outlet control devices (328) comprise valves, with opening of the valves resulting in the fluid flowing into the outlet conduit (326).

9. A method according to Claim 8, when dependent upon Claim 6 or 7,
5 wherein the one or more outlet valves (328) that are set to allow fluid to flow to the end of the conduit (326) are opened after the valve (319) of the cleaning fluid source (318) is opened such that a phase shift exists between the openings of the valves.

10. A method according to Claim 9, wherein the frequency of the opening of
10 the valves (328, 319) is in the range of $0 < f \leq 10\text{Hz}$.

11. A method according to any one of the preceding Claims, wherein the step of monitoring the concentration of the cleaning fluid includes analysing the pH of the fluid passing into the outlet conduit (326).

12. A method according to Claim 11, wherein the fluid delivery is ceased if the
15 pH of the fluid is detected to be substantially equivalent to the pH of the cleaning solution supplied at the start of the method.

13. A method according to any one of the preceding Claims, further including a step of draining at least some of the plurality of lines (308) of any fluid before the cleaning fluid delivery step.

20 14. A method according to any one of the preceding Claims, further including a step of flushing the plurality of lines (308) after ceasing the delivery of cleaning fluid.

15. A method according to Claim 14, wherein the post-fluid delivery flushing step includes steps of:

delivering water to the plurality of supply lines (308) such that the fluid passes into the outlet conduit via the one or more outlet devices so set;

5 monitoring the concentration of cleaning fluid passing into the outlet conduit (326), and

ceasing the delivery of water when the concentration reaches a predetermined minimum level.

16. A method according to any one of the preceding Claims, wherein the
10 cleaning fluid delivered is supplied from a container (318) and the concentration of the cleaning fluid in the container is kept substantially constant by steps of:

adding a cleaning agent to water to produce a cleaning fluid;

monitoring the concentration of cleaning agent in the cleaning fluid, and

15 ceasing the adding of the cleaning agent when the concentration reaches a predetermined level.

17. A method according to any one of the preceding Claims, wherein the temperature of the cleaning fluid is raised to a temperature at which yeast and bacterial strains normally die, e.g. around 50°C.

18. A method according to any one of the preceding Claims, further including
20 a step of modifying the one or more supply lines (308) so that they are in flow communication with a cleaning fluid source (318) instead of a normal source, e.g. a foodstuff or beverage source.

19. Fluid supply apparatus including:

a plurality of supply lines (308), each said line having an outlet control device (328) configurable to either allow or prevent fluid in the line flowing to a shared outlet conduit (326);

a cleaning fluid source (318);

5 a controller (332) which, in use, sets the outlet control devices of one or more of the plurality of supply lines;

a device (316, 319) for delivering cleaning fluid from the source to the plurality of supply lines, and

a device (336) for monitoring the concentration of cleaning fluid passing
10 through the outlet conduit,

wherein the controller uses output from the monitoring device to control the fluid delivered by the delivery device and the one or more outlet control devices.

20. Apparatus according to Claim 19, wherein the cleaning fluid delivery
15 device includes a pumping device (316) and a device (319) for controlling fluid flow between a cleaning fluid source (318) and the plurality of supply lines (308).

21. Apparatus according to Claim 20, wherein the outlet control devices (328) and/or the cleaning fluid source flow control device (319) comprise controllable valves such as solenoid valves.

20 22. Apparatus according to any one of Claims 19 to 12, wherein the outlet control devices (328) include taps (e.g. bar taps 310) that have been modified or designed to be controlled by the controller (332).

23. Apparatus according to any one of Claims 19 to 22, wherein the cleaning fluid source includes a water source (311) and a cleaning agent source (313) and the apparatus further includes a device (314) for mixing the cleaning agent and water.

5 24. Apparatus according to any one of Claims 19 to 23, further including a device (315) for heating the cleaning fluid.

25. Apparatus according to any one of Claims 19 to 24, wherein the outlet conduit (326) comprises a drainage system (330) or container.

10 26. Apparatus according to any one of Claims 19 to 25, wherein the plurality of supply lines (308) branch from one or more downstream supply lines (303) and the device (316, 319) for delivering cleaning fluid is in flow communication with the one or more downstream supply lines.

27. Apparatus according to any one of Claims 19 to 26, wherein the controller (332) communicates with the monitoring device (336) and/or the outlet control devices (328) and/or the cleaning fluid delivery device (316, 319) by means of one or more of the following: Radio Frequency signals; a ground cable in an alternating current ring mains; conventional writing; Bluetooth (TM) signals or any other suitable communications system/network.

20 28. A cleaning kit for apparatus including a plurality of supply lines (308) and a device for delivering cleaning fluid to the supply lines, the kit including:

one or more outlet control devices (328) for use with respective one or more said supply lines, in use, each said outlet control device being set to either allow or prevent fluid in the line flowing to a shared outlet conduit;

a device (336) for monitoring the concentration of cleaning fluid passing through the outlet conduit, and

a controller (332) for setting each said outlet control device;

where, in use, the controller controls the fluid delivery device and the one
5 or more outlet control devices in accordance with output from the monitoring device.

29. A kit according to Claim 28, further including a device (315) for heating the cleaning fluid.

30. A method of installing a cleaning kit for apparatus including a plurality of
10 supply lines (308) and a device for delivering cleaning fluid to the supply lines, the method including steps of:

fitting one or more outlet control devices (328) to a respective one or more said supply lines, in use each said outlet control device being set to either allow or prevent fluid in the line flowing to a shared outlet conduit;

15 fitting a device (336) for the monitoring the concentration of cleaning fluid passing through the outlet conduit,

fitting a controller (332) which, in use, controls the fluid delivery device and the one or more outlet control devices in accordance with output from the monitoring device.

20 31. A beverage/foodstuff supply apparatus including a cleaning kit according to Claim 28 or 29.